**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of: **Shin'ya KATAYAMA et al.** Art Unit: **1794**

Application Number: **10/537,226** Examiner: **Erik Kashnikow**

Filed: **June 2, 2005** Confirmation Number: **2667**

For: **LAMINATE AND, PAPER CONTAINER AND PACKAGE USING THE SAME**

Attorney Docket Number: **100464**
Customer Number: **38834**

**DECLARATION UNDER 37 C.F.R. §1.132**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Shin'ya KATAYAMA, a citizen of Japan, hereby declare and state the following:

1. I graduated from Shizuoka University of Hamamatsu City, Shizuoka, Japan in 1988 with a Bachelor's degree in Industrial Chemistry.

2. Since 1988, I have been employed by TOKYO PAPER MFG. CO., LTD. of Fujinomiya City, Shizuoka, Japan where my present title is Manager. During my employment therein, I have worked in Development of Laminate Product.

3. I have read and am familiar with the above-identified patent application as well as the Official Action dated April 7, 2010, in the application.

4. I have read and am familiar with the contents of cited references, JP 09-058650 to Tatsuhiko; US 5,358, 785 to Akao, US 5,942,320 to Miyake, and WO 00/44632 to Frisk cited in the Official Actions in the above-identified application.

5. Under my supervision and control, I conducted the following experiments:

Materials used in the following Experimental Examples are as follows:

Base paper for a milk carton: 313 g/m$^2$, manufactured by WEYERHAEUSER Company;

EVOH: C109B, manufactured by Kuraray Co., Ltd.;

Adhesive resin: ADMER AT-2424, manufactured by Mitsui Chemicals, Inc.;

LDPE: Petrocene 204, manufactured by Tosoh Corp.

Experimental Example 1:

A layered composition of EVOH (8 μm)/an adhesive resin (8 μm)/and LDPE (34 μm) was laminated at 280 °C by co-extrusion on the back side of a base paper for a milk carton with EVOH (8 μm) being the base paper's side.

The laminate thereby obtained was cut into a piece of about 70 mm × 200 mm and it was immersed in xylene in a beaker heated in a water bath to remove the adhesive resin layer and the LDPE layer by dissolution. That is, the test sample has only the EVOH (8 μm) layer on the base paper.

On the EVOH layer of this test sample, a dye penetrant testing agent (Red Check Liquid NRC-A, manufactured by Kensa Gijyutsu Kenkyusho Co., Ltd.) was applied and then the liquid was wiped out with a waste after 5 seconds.

Appearance of the sample after the dye penetrant testing agent was wiped out is shown in Picture A in the attached sheet of Pictures.

Many red penetration traces of the dye penetrant testing agent were observed on the sample.

Experimental Example 2:

A layered composition of an adhesive resin (5 μm)/EVOH (5 μm)/ an adhesive resin (5 μm)/and LDPE (35 μm) was laminated at 280 °C by co-extrusion on the back side of the same base paper for the milk carton as the one in Experimental Example 1 with the adhesive resin (5 μm) being the base paper's side.

In the similar manner to that of Experimental Example 1, the laminate thereby obtained was cut into a piece of about 70 mm × 200 mm and it was immersed in xylene in a beaker heated in a water bath to remove the adhesive resin layer and the LDPE layer by dissolution, thereby obtaining a film sample having only EVOH (5 μm).

The film test sample having only EVOH layer was put on a white paper, and applied with the dye penetrant testing agent in a similar manner to that in Experimental Example 1, and then the liquid was wiped out with a waste after 5 seconds.

Appearance of the sample after the dye penetrant testing agent was wiped out is shown in Picture B-1 in the attached sheet of Pictures.

Appearance of the white paper surface after removal of the film test sample is shown in Picture B-2.

Penetration traces of the dye penetrant testing agent were not observed at all on the white paper.

6. From the attached experimental results, I have concluded among other things the following:

As mentioned above, many red penetration traces of the dye penetrant testing agent were observed in Experimental Example 1 in which the adhesive resin layer is not formed on the paper's side of the EVOH barrier layer. This means that many pin holes were formed in the EVOH layer, thereby easily assumable that the barrier properties of the laminate were greatly damaged due to many pin holes formed in the EVOH layer.

Formation of the pin holes are caused because the barrier EVOH layer in a molten state cannot follow the concavity and convexity of cellulose fibers' entanglement on the base paper surface when contacted with the base paper in the co-extrusion lamination process thereby causing nonuniform thickness of the layer. Namely, this suggests that a large quantity of the EVOH resin flows into the concavity part of the base paper thereby partially increasing the thickness, while the EVOH layer is thin in the convexity part of the base paper.

In addition, the EVOH layer in a molten state contacts with oxygen in an air before contacting with the base paper in the co-extrusion lamination process thereby causing oxidative deterioration to decrease flexibility of the resin. Accordingly, stretching of the resin until covering the convexity part of the base paper becomes difficult.

Because of the foregoing, the cellulose fiber goes through the EVOH layer in the part where the convexity of the fibers of the base paper surface is large, thereby forming the pin holes in the EVOH layer.

On the contrary, on the base paper's side of the barrier EVOH layer in Experimental Example 2, there is the adhesive resin layer, which protects the barrier layer by covering most of the concavity and convexity of the base paper and at the same time does not deteriorate the EVOH layer by oxidation thereby maintaining its flexibility; thus the pin holes are not formed in the EVOH layer.

Accordingly, forming the adhesive resin layer on the base paper's side of the barrier EVOH layer has the special effect in the aim to protect the EVOH layer. This point is not mentioned in Tatsuhiko.

7. The undersigned declares that all statements made herein of his own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

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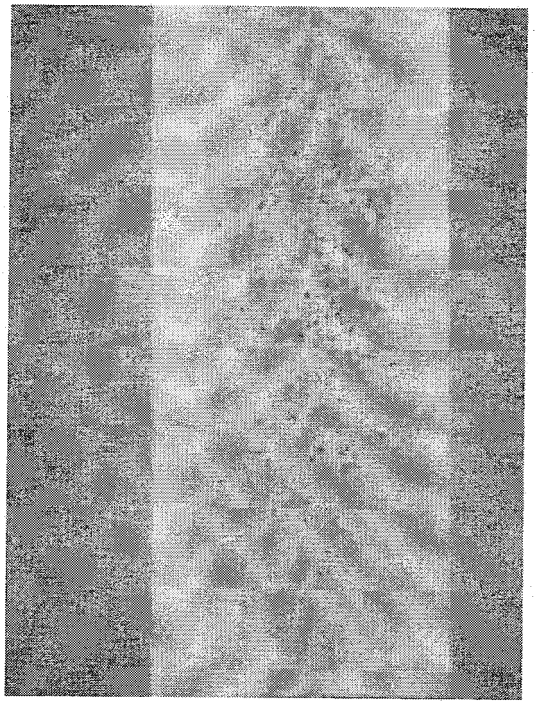
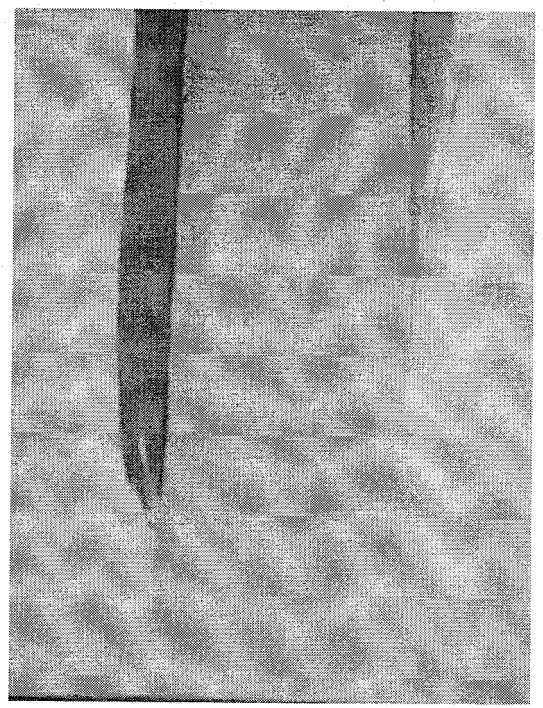
Shin'ya KATAYAMA

Signed this 1st. day of September, 2010.

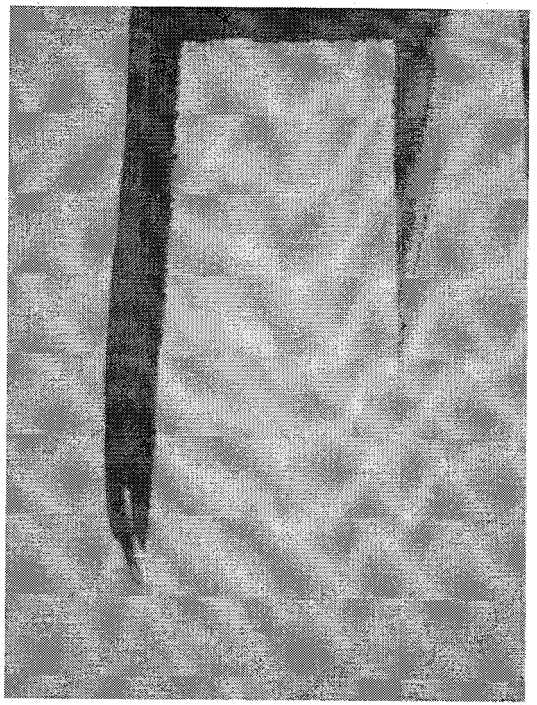
Attachment: Sheet of Pictures A, B-1 and B-2



A



B-1



B-2